2021: IPC YEAR IN REVIEW

At IPC, we continue to focus on helping the world build electronics better. How have we done that in 2021, and how have we ensured that standards, education, advocacy, and solutions supporting the global industry contributed to the competitive excellence and financial success of our members, who are participants in the global electronics industry?

2021 brought challenges and rejuvenation to IPC, as we pursued every opportunity to serve our members and help lead the industry through a difficult year. Following are the highlights and results of those efforts.

ADVOCACY AND INDUSTRY INTELLIGENCE

As 2021 comes to an end, we, at IPC, are reflecting on a year of tremendous progress in educating policymakers, influencing policy, and laying the groundwork for even greater regulatory and legislative progress in the years ahead. Government leaders, more than ever, are understanding and acting on IPC's central message: ensuring a resilient, innovative, and secure electronics manufacturing industry requires a silicon-to-systems approach.

Our advocacy efforts have been aided by a confluence of global events which have focused renewed attention on the electronics supply chain among governments internationally. With this attention has come opportunities as governments seek to strengthen the resiliency and security of supply chains and promote technological innovation. IPC, in concert with our government relations committees and member companies, has worked effectively this year to capitalize on this heightened interest to shape public policies that promote the growth of the industry.

While looking forward to opportunities in 2022, IPC is pleased to report our 2021 GR highlights.

> **IPC raises the profile of electronics manufacturing with U.S. Government leaders.** This year, IPC responded to four requests for comments related to U.S. President Joe Biden's Executive Order (EO) 14017 on "America's Supply Chains." The EO called for 100-day and year-long reviews of America's supply chains for critical industries. IPC's comments focused on the need for a holistic approach to electronics manufacturing—an approach validated by the government in its report on the semiconductor supply chain. IPC has followed up this messaging with direct engagement with senior administration officials and members of Congress.

> **IPC champions need to couple chips funding with advanced manufacturing investments.** IPC released a groundbreaking, data-driven report in November on semiconductor advanced packaging that provides a global situation analysis of the ecosystem for semiconductor components. It highlights significant gaps in North America's advanced packaging capabilities and capacities, especially in integrated circuit (IC) substrates. IPC has pushed Congress and President Biden to pair sizeable investments in semiconductors with critically needed investments in advanced packaging. Without these investments, the U.S. Government is likely to lengthen, not shorten, the supply chain for semiconductor chips.

> **U.S. Government Funding for lead-free electronics R&D.** The U.S. House of Representatives allocated $7.5 million in its fiscal year 2022 defense spending bill for research into lead-free electronics. The funding initiative is part of a broader 5-year, $40 million IPC- and USPAE-led effort to facilitate greater integration of lead-free electronics into the defense supply chain. $15 million has been allocated to date. The House funding would keep this project on track. For its part, the Senate has included positive report language on the project. Unfortunately, Congress has yet to complete fiscal 2022 appropriations which began September 1. A continuing resolution (CR) keeps government operating on current funding levels through mid-February, but IPC is optimistic that the final appropriations bill will include funding for lead-free defense electronics R&D.

> **IPC launches European Executive Forum.** IPC, in 2021, expanded its European engagement with the industry on matters related to government relations through the creation of an executive forum. Held every other month, the forum has served as a robust platform for discussion among leading electronics executives on the direction of EU industrial policy initiatives.

> **IPC leads effort in Europe to bolster electronics manufacturing.** IPC has positioned itself as one of the leading industry voices for a strong electronics manufacturing ecosystem. Our focus in Brussels has been on bolstering Europe's EMS and PCB industries as Europe moves forward in refining its Industrial strategy for the new era. IPC produced "Digital Directions, Greener Connections" in association with DECISION Etudes & Conseils highlighting the strategic importance of Europe's electronics manufacturers leading a series of high-level meetings with the European Commission and European Parliament.

> **IPC finalizes position paper on expected EU due diligence requirements.** The new EU-wide rules are expected to introduce mandatory due diligence requirements for companies to identify supply chain risks including forced labour and environmental pollution. In concert with member companies and industry peers, IPC has advocated for a due diligence framework that is workable for complex electronics manufacturing supply chains while delivering on the objectives sought.

> **IPC sees success on PIP (3:1).** IPC successfully advocated for the industry to extend prohibition deadlines on the use of the chemical PIP (3:1) as a flame retardant and plasticizer in electronics applications and worked with peer associations and the Environmental Protection Agency to establish a more feasible, realistic compliance timeline.

> **IPC creates Environment and Health Strategic Management team (ENV SMT).** This small consortium of environmental experts from IPC member companies is working together to establish policy priorities, prepare industry positions on regulatory topics, and coordinate open policy consultations relevant to the industry. The ENV SMT kicked off in January 2021 and convened monthly. The ENV SMT enabled IPC to provide feedback to three consultations on PFAS chemicals, two comment periods on PIP (3:1), and consultations on sustainable chemicals and products.

> **IPC establishes ESG for Electronics Steering Group.** The new steering group, which has met twice monthly for much of this year, has worked to identify the industry's concerns regarding the quickly evolving and expanding regulatory obligations on environmental, social, and corporate governance topics. IPC is formulating a strategy with 2022 deliverables focused on addressing ESG concerns leveraging IPC standards, education, and advocacy.

IPC ESG for Electronics

> **IPC launches new monthly economic report and global sentiment survey.** IPC's chief economist Shawn DuBravac introduced a new industry economic report that is becoming a go-to resource for electronics manufacturers as well as external stakeholders, including the media and government leaders. Shawn also oversees IPC's new global sentiment survey which measures sentiment on the industry's vitality monthly and seeks the industry's views on timely and compelling topics related to electronics manufacturing.

> **IPC showcases new Thought Leaders Program (TLP).** Chaired by IPC Hall of Famer Mike Carano, the TLP provides a platform to those in and outside our industry who have important insights to share on electronics manufacturing. TLP participants this year have made important contributions on topics ranging from manufacturing policy, materials usage, quality controls, cybersecurity, workforce, and industry collaboration.

IPC BUILD ELECTRONICS BETTER

IPC THOUGHT LEADERS PROGRAM

IPC Global Government Relations constantly works to build government support for policies and initiatives that strengthen the industry. We are actively tracking global policy issues and how they impact your company. We are your voice in the halls of government, but we rely on you to tell us what your concerns are so we can champion your issues and support your needs. Learn more and get involved by visiting www.IPC.org/advocacy.

EDUCATION AND TRAINING

IPC continues our goal to provide easy-to-implement, cost-effective, and efficient training programs that teach the knowledge and skills needed to perform specific job functions to industry-defined levels of proficiency. As part of the IPC Electronics Workforce Training program, we released several new PCB Design courses as well as an engineer-level course on electronics assembly. Additional highlights include:

> Engineers that are new to our industry need to familiarize themselves with the key tools, materials, and processes of electronics assembly. IPC launched a new course in 2021, Electronics Assembly for Engineers, designed for new engineering graduates and engineers from other disciplines to master the practical knowledge it can take years of experience to acquire.

> In addition, operators were able to attain job skills training for electronics assembly and wire harness assembly operators with courses available in English and Spanish. These courses cover the fundamentals such as process explanations, ESD, and safety but also include job-specific modules that illustrate the best practices of a successful assembly operator. Additional courses offer an exploration of standards such as J-STD-001, IPC-A-610, and WHMA/IPC 620 from the operator's perspective.

> IPC added new PCB Design courses covering topics such as design for manufacturability, design for radiofrequency, and design for embedded components. We are starting 2022 with a new course PCB Design for Printed & Wearable Devices. Look for more new courses throughout the year as well as our most popular courses like PCB Design I & II, rigid-flex and military and aerospace applications, as we continue to build on our curriculum and pathway of coursework.

CERTIFICATION

IPC certification plays a key role in bringing value to the electronics industry, and had a record year in 2021, with 115,000 certification registrations. The previous record was **108,000 in 2019.** These certification programs issue an industry-recognized certification with endorsements based on the following IPC standards; **J-STD-001, A-610, A-620, A-600, 7711/21, and 6012. In 2021**, IPC has released the 610H Endorsement for its CIS/CIT Certification programs in o**ver 20 languages**. In addition, IPC has released the **001H Endorsement for its CIS/CIT Certification programs in 9 languages.**

CURRENT STATISTICS ON CERIFICATION:

> **Current CIT (individuals) 9,200**
> **Current CIS (individuals) 143,000**
> **Countries with IPC certification. 130**
> **Companies with IPC Certified Employees . . 8,700+**

SOLUTIONS

IPC works closely with the electronics industry to identify and collaborate on finding solutions to industry challenges. In 2021, collaboration occurred in several areas:

> **IPC THOUGHT LEADERSHIP** — The intent — drive the industry forward. In 2021, IPC Solutions collaborated with technical and business leaders from across the global electronics industry including OEM producers, EMS providers, PCB fabricators, as well as material and equipment providers. More than thirty thought leader engagements were delivered throughout the year spanning keynotes, industry presentations, expert panel discussions, an engineering journal, trade articles, interviews, and podcasts. The message — **Collaborate. Modernize. Transform.**

> **ADVANCED PACKAGING INDUSTRY RESEARCH AND ADVOCACY** — In November, a landmark IPC Industry Research report was released titled **"North American Advanced Packaging Ecosystem Gap Assessment Critical Systems, Capability, Capacity Analysis, and Recommendations"**. The intent of the report is to create a healthy climate and foster North American electronics advancement. Important messages include 'Manufacturing Matters' and a **'Silicon to Systems'** approach is needed moving forward. IPC continues advocacy efforts with the government to increase awareness and domestic financial investment.

> **FACTORY OF THE FUTURE** — IPC's Factory of the Future program is approaching its first full year of execution, which commenced in January 2021. The intent of the program is to harness the full potential of the **factory of the future/i4.0 technologies**. Collaborating with companies solving real business problems, delivering measured business value, and enabling a sustainable electronics manufacturing ecosystem. Deliverables include the Chief Technologist Council now with sixteen member companies, continued **IPC-2591 CFX** adoption and implementation within **OEM and EMS** operations around the world, and expansion of IPC's digital standards portfolio.

> **STANDARDS PIPELINE & GROWTH** — With the accelerating rate and pace of changing technologies, it is critical that IPC is at the forefront of these changes to help companies develop new standards, new families of standards, and update content within existing standards. IPC Solutions is continually examining and identifying new technology needs by the industry. In 2021, a new IPC digital standards portfolio was established that contains new Factory of the Future based standards including **CFX, Model-Based Design, Cybersecurity, and Digital Twin**. Most notably IPC's first sustainable electronics standard, led by Apple, **IPC-1402 'Green Cleaners Used in Electronics Manufacturing'** has been initiated. Another highlight pertains to the creation of a new family of standards — IPC's first power electronics firmware standard has been initiated and led by PSMA and IBM.

> **IPC APEX EXPO TECHNICAL CONFERENCE** — The Solutions group is driving **IPC APEX EXPO** to be industry's premier technical conference; focused on increasing quality of content offered. For IPC APEX EXPO 2022, over **40%** of the content will be presented by Ph.D. level authors spanning 18 different countries. There have been numerous changes throughout 2021 including a fully re-built Technical Program Committee (TPC), expanded awards offerings, a spotlighted Factory of the Future track, expanded 4-track conference with **151 abstracts, 112 papers, and 30 professional development courses**. As well, the conference offers its first Factory of the Future PD course on data analytics within manufacturing operations. Another first is the launch of IPC's Factory of the Future Pavilion, showcasing F2 based companies on the EXPO show floor.

IPC STANDARDS

IPC provides standards and quality programs that support the electronics industry and ensure superior quality, reliability, and consistency in electronics manufacturing. IPC is fortunate to have the active participation of members in these activities, enabling us to tap into the global talent of the best and the brightest international members in the industry. In 2021, the following highlights illustrate achievements in standards development.

- CFX engagement increased. – Committee members (199) covering **OEM, EMS, Equipment Suppliers, Software Companies**
  - Meeting IPC-2591-CFX QPL – **11 companies with 32 pieces of equipment**
- The **IPC Validation Services** Programs continued to grow in 2021.
  - The I**PC Technology Solutions (TS) program** offered seven EMS providers and suppliers the opportunity to streamline operations and resolves specific process problems.
  - **IPC Standard Gap Analysis (SGA)** program helped identify the gaps between current practices and the IPC Standards in four companies.
  - **IPC Qualified Products List (QPL)** issued two IPC-4101 qualifications for base materials.
  - In 2021, 33 companies qualified to the **IPC Qualified Manufacturers** List
  - *A total of **34 IPC Validations** projects were completed in the **US, Canada, and Mexico in 2021.**
  - Looking ahead to 2022 — The industry demand for the I**PC-1791 "Trusted Supplier" Program covering Cybersecurity will be a focus in 2022.** The IPC 1791 QML is currently the only industry standard covering the necessary and desired cybersecurity criteria.
  - Program price updates will now include nonmember pricing. **Manufacturer Agreement contracts will be updated for all programs to improve accountability.** A new pre- and post-audit procedure will streamline the audit process and accumulate the VOC (voice of the customer) data needed for growth and expansion of Validation Services.

STANDARDS AND ADDENDUMS RELEASED IN 2021:

IPC-9257, *Requirements for Electrical Testing of Flexible Printed Electronics*

IPC-6902, *Qualification and Performance Specification for Printed Electronics on Flexible Substrates*

IPC-2591 *v1.3, Connected Factory Exchange (CFX)*

IPC J-STD-001HS, *Space and Military Applications Electronic Hardware Addendum to IPC J-STD-001H Requirements for Soldered Electrical and Electronic Assemblies*

IPC-4552B, *Specification for Electroless Nickel/Immersion Gold (ENIG) Plating for Printed Boards*

IPC J-STD-001H – Illustrations

IPC-A-610H – Illustrations

IPC-6013E, *Qualification and Performance Specification for Flexible/Rigid-Flexible Printed Boards*

IPC-1791B, *Trusted Electronic Designer, Fabricator and Assembler Requirements*

IPC-6017A, *Qualification and Performance Specification for Printed Boards Containing Embedded Active and Passive Circuitry*

IPC-1401A, *Corporate Social Responsibility Management System Standard*

IPC-9709A, *Guidelines for Acoustic Emission Measurement Method During Mechanical Testing*

IPC-6012EA, *Automotive Applications Addendum to IPC-6012E Qualification and Performance Specification for Rigid Printed Boards*

IPC-6012E, *Qualification and Performance Specification for Rigid Printed Boards*

IPC-T-50N, *Terms and Definitions for Interconnecting and Packaging Electronic Circuits*

IPC-1071B, *Intellectual Property Protection in Printed Board Manufacturing*

IPC-1072-AM1, *Intellectual Property Protection in Electronic Assembly Manufacturing*

IPC-HDBK-001H, *Handbook and Guide to Supplement J-STD-001*

IPC-1782A, *Standard for Manufacturing and Supply Chain Traceability of Electronic Products*

- **SummerCom 21 saw a return to face-to-face meetings** — SummerCom 2021, held in Milwaukee, Wisconsin, was the first face-to-face committee meeting held since the start of COVID, with 103 attendees. The Golden Gnome Awards were introduced at SummerCom 2021. The Golden Gnomes, to be presented annually at SummerCom, recognize the contributions of IPC's A-Teams. A-Teams contribute by reviewing and making recommendations to comments in advance of meetings and often working action items in preparatory sessions.

- **Industry standards development and revisions completed in record time** — With the assistance of expert volunteers in the industry, IPC released 15 new or revised standards in 2021 covering materials, PCB design, industry terminology, Intellectual Property Protection, automotive electronics, CFX, digital twin, traceability, and acceptance of printed boards.
  - Released 35 translated standards in 2021
  - The languages to which we translated and published standards this year (including China and Asia Pacific):
    1. French
    2. German
    3. Spanish
    4. Danish
    5. Polish
    6. Chinese (Simplified)
    7. Chinese (Traditional)
    8. Japanese
    9. Korean
    10. Vietnamese

IPC EVENTS

The impact of the pandemic on live events required the Events team o adapt quickly to the rapid changes from in-person to virtual events.

2021 HIGHLIGHTS:

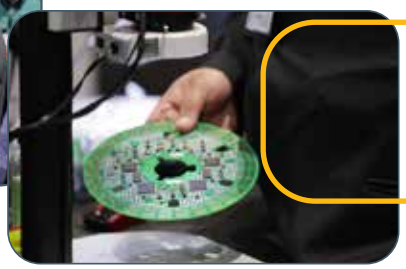
IPC APEX EXPO Virtual Live and On-Demand, held in March 2021

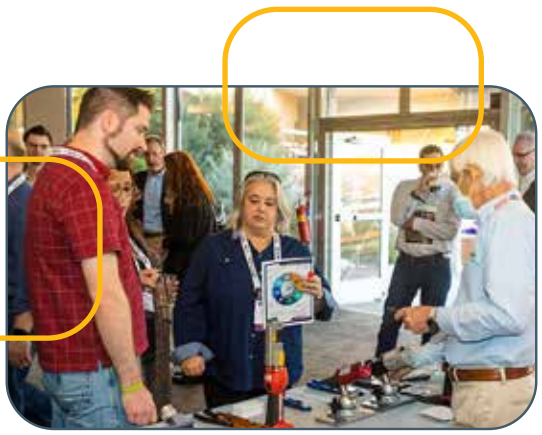
- First ever virtual event of this magnitude
- More than 100 educational offerings
- Access to all 29 professional development courses
  - NEW! Attendance for PD courses were applicable toward continuing education points toward MIT recertification
- OnDemand access to content for 90 days as many times as possible
- 240 exhibitors
- Provided free access to daily keynotes, exhibitor new product demonstrations and awards presentation
- Online community to connect with industry colleagues, exhibitors, and subject matter experts

The IPC E-Textiles Virtual World Tour 2021 provided a free passport to virtual e-textiles destinations around the world, including stops at the Taiwan Textile Research Institute, the Pennsylvania Fabric Discovery Center, Fraunhofer IZM in Berlin, and the Japan Electronics Packaging and Circuits Association.

The Executive Forums, held monthly for both IPC/WHMA and IPC Europe and led by IPC President and CEO John Mitchell, provided electronics manufacturing leaders with a platform to discuss issues of concern for members. Their popularity has led to a continuation of the meetings into 2022.

Webinars on various issues pertaining to the electronics manufacturing industry were held throughout the year. Topics included: Factory of the Future, cybersecurity, career paths in electronics, chemical prohibitions in cable and wire harness, and flexible electronics and the future of devices.



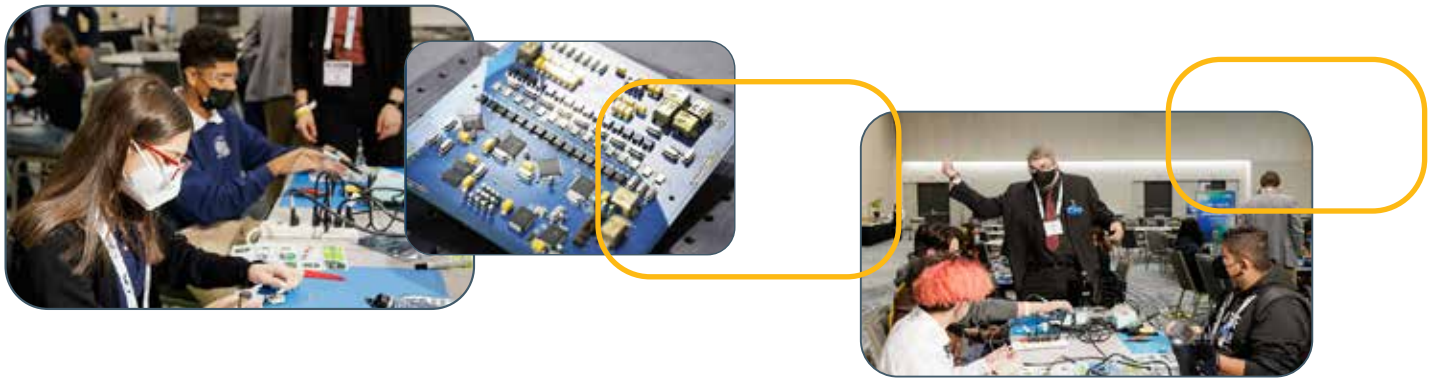


IPC EDUCATION FOUNDATION (IPCEF)

IPC | EDUCATION FOUNDATION

Building a Stronger Global Talent Pipeline

THE IPC EDUCATION FOUNDATION MISSION: Develop a pipeline of new talent entering the electronics industry by creating awareness of the careers the electronics manufacturing industry has to offer, and providing students access to knowledge, content, and connections.



TWO SUCCESSFUL CAREER PANELS — Hosted two career paths discussions in February and November which reached more than **5,000 students and teachers** interested to learn more about the various career opportunities. Panelists came from IPC's connections with industry and support from **IPC Emerging Engineers.**

IPC STUDENT CHAPTER GROWTH — The IPC Student Chapter Program has expanded its reach to **53 universities and community colleges** within the U.S. impacting more than **750 students.**

AWARDED $35,000 IPC SCHOLARSHIPS AND AWARDS — Recognized **27 deserving IPC student members** with an IPC Member Scholarship, awarded **six IPC Student Leadership Awards** to chapter leaders, and granted two Michael Carano Teacher Excellence Awards.

PCBTHECHANGE DESIGN COMPETITION — Launched in partnership with **Altium's Upverter Education and Arduino** — we have received a total of **87 registrants** from high schools, community colleges and universities around the world: **17 countries** which included teams from India, Nigeria, South Africa, Greece, Iran, Afghanistan, France, Australia, and of course the United States and Canada.

INCREASED ACCESS TO INDUSTRY-RELEVANT CONTENT — Provided an industry terminology guide, video training libraries, webinars, and IPC standards to **hundreds of STEM teachers** in high schools and students in community colleges and universities.

IPC GLOBAL OUTREACH

IPC is a global organization with offices in China, India, Southeast Asia and Europe. Although the pandemic affected each of our offices differently, there were measures of success as each worked to support IPC members and the global electronics industry from their corner of the world.

IPC EUROPE

- IPC European Electronics Manufacturing Executive Forum — Since January, IPC has been chairing a recurring online meeting dedicated to Europe's electronics manufacturing leaders to give them a platform to exchange and discuss strategic topics that the industry is facing, ranging from industrial policy to supply chain resiliency to advanced packaging; there have been 6 meetings held during 2021 bringing together an average of 30 participants from 20 companies.
- IPC UK Contract Electronics Manufacturing Executive Council — Since March, IPC has been chairing a recurring online meeting dedicated to the U.K.'s EMS executives to give them a platform to exchange and discuss strategic topics that are unique to their ecosystem, ranging from Brexit to components shortages to workforce development; there have been 3 meetings held during 2021, bringing together an average of 20 companies.
- EMS Focus — Building on its new tagline "Build Electronics Better" IPC spent much of 2021 developing specific activities aimed at engaging Europe's EMS vertical. These included: signing a partnership with In4ma's Dieter Weiss to support his EMS statistical efforts; participating and sponsoring events like IPC EMS Day in Estonia and EMS Tag in Germany; conducting a membership drive aimed at smaller enterprises; championing the Global Sentiment Survey to help provide industry intelligence; and adding Enics' CEO, Ms. Elke Eckstein, to the IPC Board of Directors, which also currently has strong European participation from Viscom's Carsten Salewski and Continental's Robert Feuerstein.
- EAE Promotion and Adoption across Europe — Developed by the Industry for the Industry, IPC's Education Team successfully launched Electronics Assembly for Engineers (EAE) — a fully online, self-paced, 12 module training program to onboard new engineers with the fundamentals of PCBA; within 3 months of its July release, European EMS companies, and OEMs put nearly 150 engineers through the program.
- Technical activities — IPC is placing heavy emphasis on creating standards development activities and driving best practices guidelines in Europe. Examples of this include the French Design Council which will soon release "IPC Design Standards Usage Guide, Training and Reference Guide to IPC-DRM-Design"; a French committee soon to be evolving into a European innovation committee tasked with looking into specific opportunities within smart plastics, structural electronics, and "plastronics"; and continued CFX growth as European companies take the global lead in transforming factories of the future.

IPC INDIA

- IPC India Regional office is celebrating a decade of service to the electronics manufacturing industry by holding skills challenge competitions and member networking events from November 2021. This will all culminate with the inaugural Integrated Electronics Manufacturing and Interconnections (IEMI) event scheduled in New Delhi & Bengaluru in August 2022. Several Indian & International Associations are supporting the event.

- Despite COVID 19 challenges and three months lockdown, IPC India delivered certification programs virtually and organized live training at Bengaluru, Chennai, New Delhi, Hyderabad, and Pune in 2021. IPC India introduced the "mobile training" concept, with support from an instructor. Tools and equipment are loaded in a cab and moved to different locations outside Bengaluru. 2021 saw a sharp rise of IPC 610 certifications in India.
- IPC India is exploring new potential locations. A live networking session on "Designing & Producing Quality – Reliable Electronics" was organized at Gandhinagar, Gujarat on October 5. 100 + electronics manufacturing professionals participated at the event. With support from Sri Lanka Electronic Manufacturers & Exporters Association organized a virtual session on "Acceptability of Electronic Assembly Best Practices" on October 27. 50+ companies from Sri Lanka participated in the session.
- The success of IPC India webinars: During 2021, IPC conducted 17 virtual sessions on various topics and participated in 6 virtual sessions organized by other Associations and Government Agencies. 3500+ registrations received with 70% attendance at the webinars. Topics were framed from various standard documents and endorsement programs.
- IPC India opened a Standards department to closely work with the industry in engaging members and developing IPC standards from the region. The Standards team worked on the 610 & J-STD-001 review process and revived 161 comments. After filtering 89 comments, a final review meeting was conducted at Bengaluru on November 12. 19 members participated at the meeting both physically & virtually.

IPC ASIA

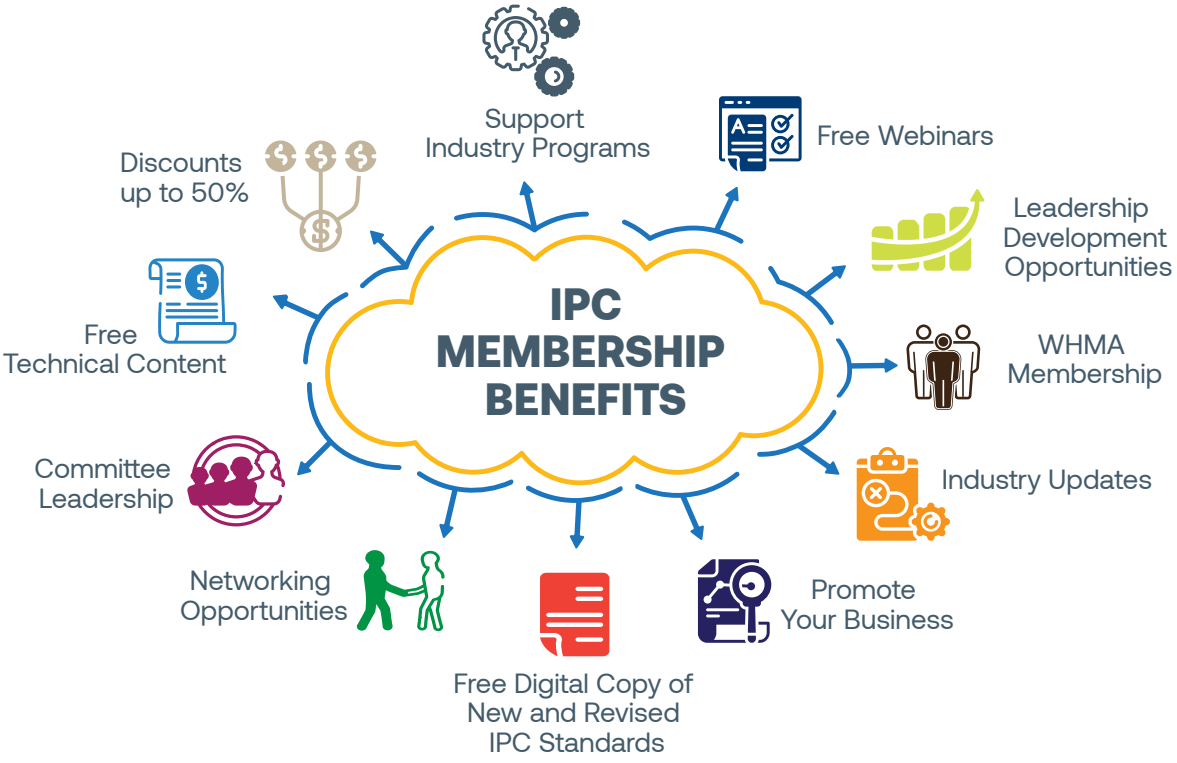
The influence of IPC standards and certification programs continues to grow

- Standards shipment increased by 30%
- Certification volume reached 6,600, a 13% YOY growth.
- Automotive industry become the biggest growth driver.
- Five new QML listed companies in Asia, total listed companies in Asia reached 25.
- Started to provide standards in Traditional Chinese for Taiwan market.
- China companies start to lead some of IPC standard development projects
- 620CR, 610GR chaired by CRRC and 2552 MBD chaired by Huawei are expected to be released by the end of the year.
- The establishment of ASSC will inject vitality into IPC's standards development activities in Asia. More new projects related to EV, SIP, test methods, F2 and other fields are expected to be launched in the future.
- Globalization Effort in Asia Entered a New Stage
- Established Japan team to grow IPC's activities and business in Japan, better engage with local companies, industry peers, and government.
- A total of 10 IPC standards were translated into Japanese and a total of 2,500 people participated in 9 online technical seminars.
- Toyota Motors officially adopted IPC standards of 610, 001, and Automotive addendums into their soldering quality standards.
- The establishment of IPC's first standard technology group in Japan (610/001 Automotive) is underway.
- Korea representative joined, focusing on standard promotion and member engagement. Standards and certification adoptions grow fast in Korea with more Korean enterprises hoping to join IPC standard development task groups especially in areas such as PCB design, automotive electronics, and advanced packaging.
- Strengthen Member Services and Regional Events
- CEMAC held in May in Shanghai with 100+ member companies' participation.
- China HSC held with support from host companies SGMW, CRRC, participation increased to 260 contestants, a 63% YOY growth.
- "Member online community" launched with 100+ active companies.
- Asia membership reached 800, accounting for 25% of the total IPC membership.
- Next-Generation Talent Development
- Chengdu Aeronautic Polytechnic as the education institution partner of IPC Asia is providing IPC CIS training to their students.
- Partnership with TTM Asia team on Asia Scholars Program, aiming to cultivate next generation of leaders for electronics industries through first-class internship projects.

IPC MEMBERSHIP

Membership in IPC drives quality, reliability, and consistency in the global electronics manufacturing industry. Happily, IPC worldwide membership continues to grow. In 2020 IPC announced a new membership model and dues structure. Beginning on January 1, 2021, the site-based and enterprise memberships was replaced by a company revenue-based model.

- As of the end of 2021, **more than 80%** of site-based members have converted to a company-based membership model, the remaining multi-year site-based members will be converted to a company revenue-based model in the years **2022 (14%) and 2023 (3%).** We have also grown membership overall with a total of **3,010 company members** globally.
- IPC member feedback has been positive about the new model and its benefits. With company revenue-based membership, all company sites and all employees globally can utilize IPC membership. As an IPC member, companies can engage in global government relations and environmental policy advocacy, participate in standards development, save up to **50% on IPC standards** purchases, plus up to 2**5% discount** on training and education, receive complimentary admission to exclusive webinars, enjoy special pricing for all official IPC events and participate in the statistical program and other industry intelligence studies. Member companies are also eligible to receive complimentary copies of newly released or revised IPC standards.
- Throughout 2021 we continued to focus on improving our customer service experience. In 2021 we have resolved more than **92% of customer inquiries** within one business day, and **70%** have been resolved the day they were received. The new IPC online bookstore went live in August 2021. As the store is being continuously enhanced, the IPC customer service and member success team has been working with members and customers closely making sure we continue to deliver high-quality experience and support.
- These efforts will continue throughout upcoming years and members can expect to see significant improvements, including to the online platforms that they use to access our content. And as always, we will continue to expand the range of products and services that we offer to meet the needs of a constantly evolving industry.
- More than **3,100 companies around the world** depend on IPC programs and services to further their competitive advantage and financial success. IPC members represent all facets of the electronics industry, including design, printed board manufacturing, electronics assembly, and test.



2022
WHAT'S AHEAD?

There is no doubt that post-pandemic, economic, and technical challenges along with regulatory issues will continue into 2022 and beyond. With the support and engagement of members and the industry, IPC's volunteers and staff will continue to deliver valuable educational and networking opportunities, advocacy, standards, thought leadership, industry intelligence, and technical resources.

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IPC maintains additional offices in Washington, D.C., and Taos, New Mexico, USA; Stockholm, Sweden; Moscow, Russia; New Delhi, India; Bangkok, Thailand; and Shanghai, Shenzhen, Suzhou, Chengdu and Beijing, China.